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Indian Army Releases UAS and Loitering Munitions Technology Roadmap 2026

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SECURITY & DEFENCE**GS3**

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Indian Army Releases UAS and Loitering Munitions Technology Roadmap 2026

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WHY IN NEWS

The **Indian Army** released a comprehensive **50-page “Technology Roadmap for Unmanned Aerial Systems (UAS) and Loitering Munitions”** at **Bharat Mandapam, New Delhi** on April 8, 2026. The document was released by **Lt Gen Rahul R Singh, Deputy Chief of Army Staff (Strategy)**. It outlines

requirements for **30 UAS types across approximately 80 variants** in five operational categories, signalling the Army’s intent to indigenise drone capabilities and directing future procurement and design priorities.

FIVE OPERATIONAL CATEGORIES

CATEGORY	ROLE	EXAMPLES
1. Surveillance UAS	Intelligence, Surveillance, Reconnaissance (ISR)	HALE (High Altitude Long Endurance), MALE (Medium Altitude Long Endurance)
2. Loitering Munitions	Precision strike, kamikaze drones	Nagastra-1, SkyStrike
3. Air-Defence UAS	Counter-UAS (C-UAS), drone intercept	Anti-drone systems, jamming
4. Special-Role UAS	Electronic warfare, psychological ops, decoys	EW payloads
5. Logistics UAS	Last-mile supply in inaccessible terrain	Heavy-lift cargo drones

KEY CONCEPTS FROM THE ROADMAP

UAS Classes Referenced

CLASS	ALTITUDE RANGE	ENDURANCE	ARMY USE
HALE	>15,000 m	>24 hours	Strategic ISR
MALE	5,000–15,000 m	12–24 hours	Operational surveillance
Mini/Micro UAS	<500 m	<2 hours	Tactical platoon-level
FPV (First-Person View)	Very low	<30 min	Urban warfare, precision strike
Swarm Drones	Various	Various	Saturation attack/defence



MUM-T — Manned–Unmanned Teaming

A key concept in the roadmap where **piloted aircraft (helicopters or fighters) coordinate with UAS** to extend ISR reach and precision strike capability. Used by the US in Apache-Grey Eagle teaming; India’s ALH Dhruv and future IMRH are candidate platforms.

CONTEXT — WHY DRONES HAVE BECOME CRITICAL

Lessons from Recent Conflicts

- **Nagorno-Karabakh (2020):** Azerbaijan’s Bayraktar TB2 drones decisively defeated Armenian armour — the first major confirmation of loitering munitions’ battlefield dominance.
- **Ukraine-Russia War (2022–present):** Both sides use FPV kamikaze drones at scale; drones now account for majority of battlefield strikes.
- **Israel-Gaza:** Israel’s use of ISR + strike drones for precision targeting.

These conflicts reshaped global military doctrine, accelerating India’s drone ambitions.

India’s Previous Drone Procurement

PLATFORM	SOURCE	STATUS
Heron (surveillance)	Israel	Inducted
Rustom-2 / TAPAS	India (DRDO)	Under trials
Nagastra-1 loitering munition	India (Solar Industries)	Inducted (Army)
MQ-9B Predator (HALE)	USA	Contract signed (₹32,000 crore)
Drishti-10 Starliner	India	Inducted (Navy, Coast Guard)



AATMANIRBHAR BHARAT IN DRONES

Government Initiatives

POLICY / SCHEME	DETAIL
Drone Rules 2021	Liberal framework for civilian + military drone operations
Production Linked Incentive (PLI) for Drones	₹120 crore PLI scheme for Indian drone manufacturers
Drone Shakti	Initiative to promote drone startups via iDEX and DPIIT
iDEX (Innovation for Defence Excellence)	Challenges for startups — DIC (Defence India Challenges) for UAS
Positive Indigenisation List	Specific UAS types on the list — import ban, only domestic procurement

Defence Export Potential

- India **exported loitering munitions** (Nagastra-1) to a friendly country in 2025 — first such export.
- DRDO's **Archer** loitering munition in development.
- **Economic Survey 2025–26** highlighted drones as a key dual-use technology for export growth.

COUNTER-UAS (C-UAS) — THE OTHER SIDE

The roadmap also addresses **defence against adversary drones**:

- **Electromagnetic jamming** (disrupts GPS/control links)
- **Hard-kill systems** (directed energy weapons, missiles)
- **Drone detection** (radar, acoustic sensors, RF scanners)
- **Netting and physical barriers** at critical installations

India's **Integrated Air Defence** network is being upgraded to handle the drone threat, including from Pakistan's growing UAS inventory (TB2, Shahpar-2).



UPSC RELEVANCE

GS Paper 3 — Security

- **Internal and external security** — drone warfare as disruptive technology
- **Indigenisation in defence** — Aatmanirbhar Bharat, Positive Indigenisation Lists
- **Cyber-electronic warfare** nexus with UAS

Mains Linkages

- “Drones are the new cavalry” — discuss implications for India’s security doctrine
- Role of private sector in defence manufacturing (iDEX, PLI, DPSUs vs. private OEMs)
- MUM-T as a force multiplier

FACTS CORNER

ITEM	FACT
Document length	50 pages
UAS types covered	30 types, ~80 variants
Operational categories	5 (Surveillance, Loitering Munitions, Air Defence, Special Role, Logistics)
Released by	Lt Gen Rahul R Singh, DCOAS (Strategy)
Venue	Bharat Mandapam, New Delhi
Key concepts	HALE, MALE, FPV, Swarm, MUM-T
India’s inducted loitering munition	Nagastra-1 (Solar Industries)
HALE drone procured from USA	MQ-9B Predator (₹32,000 crore)
PLI for drones	₹120 crore
India drone export	Nagastra-1 (first export, 2025)



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